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EXAMINER

EJAZ, NAHEED

ART UNIT PAPER NUMBER

2631

DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

✓

## Office Action Summary

Application No.

10/083,305

Applicant(s)

GORCEA ET AL.

Examiner

Naheed Ejaz

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4,7,8,13,14,16,18, 22-24, and 27 are rejected under 35 U.S.C 103(a) as being unpatentable over Gardner et al. (U.S. 6,580,751), hereafter referred to as Gardner, in view of Rhodes (5,301,208).

Referring to claim 1, Gardner discloses, a receiving path and transmitting path operatively coupled to receiving and transmitting ports respectively (see figure 11, Sensor Node # 1, 'TX' and 'RX'). Windings 72 and 74 are considered to be the second and fourth coils of the applicant's 1<sup>st</sup> and 2<sup>nd</sup> transformers since these windings are transmitting signals (see figure 2, element 72 & 74). Element 81A of figure 11 is considered to be the third and fifth coils of the applicant since they are coupled to receive signals. Furthermore, Gardner teaches that there is an attenuation and frequency dispersion of a wave when it propagates down the twisted pair cable (see col.8, lines 61-67, col.9, lines 1-15) (it should be noted that this loss (attenuation) is because of the resistance (impedances) used by twisted pair cable (see col.6, lines 43-47)). Moreover, he discloses that the gain is the reciprocal of the attenuation and therefore, it compensates the signal loss caused by the resistance in the twisted pair cable (see col.6, lines 36-43) which is part of the circuit of two coupled transformers.

Although Gardner is suggesting about compensating loss through gain, which could be at the receiving side of the circuit but he does not teach about active impedances explicitly.

However, Rhodes reference is using two coupled transformers to have coupler circuit (see col.2, lines 35-37) which is making sure if there is not any impedance discontinuities (see col.2, lines 55-62 ) in order to reduce or prevent the circuit from insertion losses which means to reduce the power consumption and hence has the 'functional equivalency' to applicant's limitations of having 'active impedance element introducing a loss' in the claim (see col.5, lines 29-68).

Furthermore, in response to applicant's remarks (page # 8, lines 9-16), it should be noted that Gardner's transformer (figure 11, element 70A) is connected to transformer 81A which forms the receiving path and hence the receiving port (as mentioned above) and is connected to the coil which considered to be equivalent to applicant's third coil of the transformer (as described above) and hence reads on the applicant's limitation of third coil connected to receiving port.

It would have been obvious to one ordinary skill in the art to implement the teachings of Rhodes into Gardner in order to avoid impedance discontinuities and resulting signal reflections with minimum insertion losses that is to reduce the signal power loss in the circuit as taught by Rhodes (col.3, lines 5-8, col.5, lines 60-68).

Refer to claim 2, "The modem of claim 1, wherein said modem comprises an XDSL modem", Gardner discloses ADSL modem (column 8, lines 4-14 and figure 11).

As to claim 3, "wherein said transmit port comprises a differential transmit port",

Gardner discloses in his teachings that the transmit port is differential transmit port (see figure 11).

As to claim 4, "wherein said gain offsets said loss", it is also rejected under the same rational as mention in claim 1 above because it would have been obvious to a person of ordinary skill in the art to see that the gain compensates the losses in the circuit invented by applicant.

Regarding claim 7, "wherein said receive port comprises a differential port", Gardner proclaims in his teachings that the receiving ports include a differential port (see figure 11 and column 13, lines 10-13).

Refer to claim 8, "wherein said transmit path further comprises a power amplifier", Gardner discloses a transmitter (TX) which comprises a power amplifier (see figure 11).

Claim 13 is also rejected under the same rational as mention in claim 1 rejection above.

Claim 14 is also rejected under the same rational as mention in claim 1 rejection above.

Claim 16 is also rejected under the same rational as mention in claim 1 rejection above.

Claim 18 is also rejected under the same rational as mention in claim 1 rejection above.

Claim 22 is rejected under the same rational as mentioned in claim 1.

Art Unit: 2631

Furthermore, Rhodes discloses impedances (col.5, lines 44-68) and transceiver (col.1, lines 58-61).

It would have been obvious to a person of ordinary skill in the art to implement the teaching of Rhodes into Gardner in order to avoid impedance discontinuities and reduce insertion losses in the transformer as taught by Rhodes (see column 5, lines 65-68).

As to claim 23, Gardner teaches all the limitations in the previous claim, on which claim 23 depends but he fails to disclose active impedance explicitly.

However, Rhodes discloses, "the transmit power amplifier has an active impedance" (see claims 1 and 22 rejection above). Furthermore, in order to protect the signal from distortion to the load one has to choose the characteristic impedance that would correctly match at the driver and the receiver.

Therefore, it would have been obvious to a person of ordinary skill in the art to implement the teaching of Rhodes into Gardner in order to not to have signal reflection and have a stable signal it is necessary to avoid impedance discontinuity by Rhodes (column 5, lines 29-43 and column 7, lines 43-46).

As to claim 24, Gardner discloses, "each of the third and fifth coils have first ends, which are coupled together, and second ends, which form the receive port" (claim rejection 1 above) (it should be noted that 'RX' (figure 11, Sensor Node # 1, 'RX') has two windings (element 81A) (considered to be the third and fifth coils of the applicant) both have their first and second ends coupled together and forming the receiving path 'RX' and hence receiving port and is equivalent to applicant's limitations).

Refer to claim 26, Gardner teaches about two transformers, modem, transmitting and receiving ports, and two power amplifiers as described in claim 1 rejection above but fails to disclose active impedance explicitly.

However, in addition to aforementioned claim rejection 1, Rhodes teaches two transformers having impedances included in the circuit (column 5, lines 44-68).

It would have been obvious to a person of ordinary skill in the art to implement the teaching of Rhodes into Gardner in order to avoid impedance discontinuities and reduce insertion losses in the transformer as taught by Rhodes (see column 5, lines 65-68).

Claim 27 is rejected under the same rational as mention in claim 23 above.

3. Claims 5,15 and 17 are rejected under 35 U.S.C 103(a) as being unpatentable over Gardner et al. (U.S. 6,580,751), hereafter referred to as Gardner and Rhodes (5,301,208), as applied to claims 1-4,7,8,13,14,16, and 18 above, and further in view of well known transformer equations.

Refer to claim 5, in addition to aforementioned rejection of claim 1, Gardner teaches all the features of the claimed invention except, "wherein said gain is created in said third coil and comprising more windings than said first and second coils and said fifth coil comprising more windings than said fourth coil", the gain into the receiving paths being introduced by third and fifth coils.

However, one of the ordinary skill in the art clearly recognizes from the well known transformer equations that by selecting different turn ratios in the primary and secondary windings of transformers, one can increase the voltage gain of one side of

Art Unit: 2631

transformer with regard to the other side (e.g. secondary side over primary side).

Furthermore, attentions should be paid to the Rhodes reference who supports the above mentioned rejection. He teaches that the signal detection capability enhances when voltage to current ratio is maintained in the coupler with the transmission line (which uses impedances and are coupled with coupler) since voltage to current ratio is equivalent to resistor (well known ohm's law  $V = IR$ ) and maintaining the ratio in order to protect the signal reflection at the receiver side suggests that if the value of the voltage increases while keeping the current value same, would increase the ratio and enhance the detection capability of the receiver as taught by Rhodes (see col.4, lines 3-13).

Therefore, there is a motivation to implement the teachings of the Rhodes into Gardner in order to protect the signal reflection at the receiving side and enhance it's capability by increasing the voltage and hence is equivalent to applicant's limitations in the claim.

Claim 15 is rejected under the same rational as mention in claim 5 rejection above.

Claim 17 is rejected under the same rational as mention in claim 5 rejection above.

4. Claims 9,10, 19-21, and 25 are rejected under 35 U.S.C 103(a) as being unpatentable over Gardner et al. (U.S. 6,580,751), hereafter referred to as Gardner and Rhodes (5,301,208), as applied to claims 1-8, 22-24 above, and further in view of Beurrier (3,789,315).



Art Unit: 2631

Regarding to claim 9, Gardner and Rhodes teach all the previous limitations in the claims on which claim 9 depends but they fail to disclose, "wherein said first, second and third coils comprise windings in a ratio of 1: 1:  $\alpha$ ", the turn ratio of the transformers.

However attention is directed to the Beurrier reference which discloses the turn ratio of the windings (column 1, lines 35-41).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to implement the teaching of Beurrier into Gardner and Rhodes in order to acquire or gain coupler windings should be connected in particular manner in terms of their ratios as taught by Beurrier (see column 2, lines 1-5).

As to claim 10, Gardner and Rhodes teach all the previous limitations on which claim 10 depends but they fail to disclose "wherein said fourth and fifth coils comprise windings in a ratio of 1:  $\alpha$ ", the turn ratio of the transformers.

However, Beurrier teaches about winding ratio of transformers (column 1, lines 51-53). Moreover, selection of number of windings is a matter of design by selecting different turn ratios in the primary and secondary windings of transformers, one can increase the voltage gain of one side of transformer with regard to the other side (e.g. secondary side over primary side) as discussed in claims 5, 15 and 17 rejection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to implement the teaching of Beurrier into Gardner and Rhodes in order to acquire or gain coupler windings should be connected in particular manner in terms of their ratios as taught by Beurrier (see column 2, lines 1-5).

Regarding claim 19, in addition to aforementioned rejection of claim 1, Gardner and Rhodes teach all the limitations in the claim as described in claim 1 but they fail to disclose winding ratio.

However, Beurrier teaches, "first, second, and third windings having a ratio of 1:1:  $\alpha$ "(column 1, lines 35-41).

It would have been obvious to a person of ordinary skill in the art to incorporate different ratios of windings disclosed by Beurrier in a transformer disclosed by Gardner and Rhodes in order to acquire coupler, windings should be connected in a particular manner in terms of their coil ratios as taught by Beurrier (see column 2, lines 1-5).

Refer to claim 20, Gardner discloses "wherein said second coil is associated with a transmit path of the modem" (figure 11, element 72) (it should be noted that element 72 which is considered to be the second coil is associated with 'TX' (figure 11) which is the transmitting path of the 'Surface Modem' (figure 11) and hence is equivalent to applicant's limitations in the claim).

Refer to claim 21, Gardner discloses, "first coil is associated with a transmission line connected to the modem" (figure 11, Sensor Node # 1, element 76), which is considered here to be the first coil, associated with a transmission line and modem (see figure 11).

Claim 25 is rejected under the same rational as mention in claim 9 rejection above.

5. Claim 12 is rejected under 35 U.S.C 103(a) as being unpatentable over Gardner et al. (U.S. 6,580,751), hereafter referred to as Gardner, Rhodes (5,301,208) and

Beurrier (3,789,315), as applied to claims 1-11 above, and further in view of Gorcea (US 2002/0121930).

Regarding claim 12, Gardner, Rhodes and Beurrier teach all the limitations in the claim but they fail to disclose value of  $\alpha$  between 2 and 3.

Gorcea discloses, ' $\alpha$  is between 2 and 3' (see page # 2, col.1, paragraph # 0013, lines 10-11, col.2, paragraph # 0016, lines 5-7) (it is noted that Gorcea is using variables 'n' and 'm' for winding ratios and these number could be in between 2 and 3 and hence is equivalent to applicant's limitations in the claim).

It would have been obvious to one ordinary skill in the art to implement the teachings of Gorcea into Gardner, Rhodes and Beurrier in order to arrange the primary and secondary windings so that current flow would be accommodated for the windings terminals as taught by Gorcea (page # 3, col.1, paragraph # 0024, lines 14-18) and provide the line driver (which includes transformer and it's windings) with output impedances and gain relatively insensitive to component tolerances (page # 1, col.1, paragraph # 0010 & paragraph # 0011, lines 1-9).

### ***Response to Arguments***

6. In response to Applicant's Amendments and Remarks the following objections/rejections have been withdrawn by the Examiner.

The objection to claim 11 for the following remarks:

Claim 11 was objected to for failing to further limit the claim. Applicant respectfully traverses. The Patent Office opines that claim 11 does not further limit claim 10 because claim 11's winding ratios of 1:1:  $\alpha$  is the same as claim 9's winding ratios of 1:1:  $\alpha$ . This statement

Art Unit: 2631

ignores the dependency chain of claims. Claims 9 and 10 both depend from claim 1, not from one another.

The Patent Office apologizes and withdraws the objection regarding claim 11.

Claim 12 was rejected under 35 U.S.C. 112 as being indefinite. Specifically, the Patent Office alleges that the statement that  $\alpha$  be between “approximately 2 and 3” is not exact. Applicant notes that precision is not specifically required for definiteness.

The Patent Office apologizes and withdraws the claim rejection under 35

U.S.C.112, second paragraph.

7. In response to Applicant's Amendments:

In the present application, the Patent Office has extracted disparate portions of Gardner and reassembled these unrelated portions using the benefit of impermissible hindsight reconstruction. The Patent Office makes these modifications without showing any motivation to make the modification, nor has the Patent Office set forth any evidence to support the modification.

Specifically, claim 1 recites a first transformer having first, second, and third coils. The Patent Office identifies element 70 of Figure 11 of Gardner as the first transformer and then states that the first coil is element 74 of Gardner. Likewise, the Patent Office identifies coil 72 of Gardner as the second coil. However, the Patent then states that left hand side windings of 81A of Gardner are the third coil. Applicant respectfully traverses this statement. Element 81A of Gardner is a separate transformer that is not part of Gardner's transformer 70. The Patent Office is impermissibly extracting the windings of 81A and inserting them into the transformer 70. The Patent Office has not properly justified the modification to the transformer 70 or the transformer 81A.

The Patent Office compounds its error by stating that the second transformer corresponds to element 80 of Gardner. In connection with this identification the Patent Office states that the left most windings of elements 70B and 81B of Gardner correspond to the fourth and fifth coils of the claim. This statement represents impermissible extraction and juxtaposition of the elements of Gardner. Specifically, element 80 is in sensor node #1 of Gardner. In contrast, elements 70B and 81B of Gardner are in sensor node N of Gardner and are, in fact, two more transformers. The Patent Office is taking windings out of two different transformers in a separate modem and placing them in the first modem. The Patent Office has not explained why this extraction and juxtaposition is proper. Absent a proper motivation and the requisite evidence, this modification to Gardner is not proper.

Applicant respectfully maintains that the implicit modifications to Gardner make Gardner unsuitable for its intended purpose. Specifically, by removing the winding from 70B and 81B,

Art Unit: 2631

the Patent Office makes sensor node N inoperable. This inoperability is evidence that the modification to Gardner is non-obvious. Furthermore, the Patent Office's modifications leave the windings 72 and the right most winding of element 81A inoperative, this inoperability is further evidence that the modifications are improper.

Absent modification, transformer 70 does not operate in any sort of receive capacity. Since transformer 70 does not operate in any sort of receive capacity, transformer 70 cannot have a third coil connected to a receive port. Since transformer 70 is not connected to a receive port, Gardner does not show the elements for which it is cited. Since Gardner does not show the elements for which it is cited, and the Patent Office has not identified where the deficiency of Gardner is cured in Rhodes, the combination of Gardner and Rhodes does not teach or suggest all the claim elements. Since the combination does not teach or suggest all the claim elements, the combination does not establish obviousness.

See claim 1 rejection mentioned above in this Office Action.

(Note: Applicant admits that there is a possibility that Gardner reference could be modified to show the elements that were cited in the first Office Action but was lacking the active impedances part of the claim (Remarks, pg # 8, lines 17-18). As mentioned in claim 1 rejection above ~~that~~ not only that Gardner teachings disclose about loss and gain in the circuit because of impedances but Rhodes is also using these impedances to reduce the signal power loss in the circuit and hence is equivalent to applicant's limitations in the claim).

8. In response to Applicant's argument that:

Claim 13 recites coupling the signal from the transmit path to the receive path, the patent Office provides no analysis for where this claim element is found in the combination of references.

In addition to aforementioned rejection of claim 1, Gardner also shows that a transmission of the signal from the transmitted path 'TX' (figure 11, Sensor Node # 1) is coupled to receiving path 'RX' (figure 11, Sensor Node # 1) and hence is equivalent to applicant's limitations of coupling the signal from the transmit path to the receive path.

9. In response to Applicant's argument that:

Claim 22 recites two transformers with the third and fifth coil coupled to form a receive port. The Patent Office relies on its analysis of claim 1 without specifically addressing this element.

In addition to aforementioned rejection of claim 1, Gardner shows two coils which are coupled to the receive port of the transformer (see figure 11, Sensor Node # 1, 'RX', element 81A, col.13, lines 17-19) (it should be noted that the two coils are responsible to receive signals as it can be seen by the direction of the arrow and forming the receive path and port).

10. In response to applicant's argument regarding claims 5, 15, and 17 that:

Specifically, the Patent Office has not properly supported the motivation to combine Gardner with the allegedly well known transformer equations. The Patent Office asserts the motivation is "to increase the voltage level at the receiver side as to enhance the detection capability of the receiver" (Office Action of May 16, 2005, page 6, lines 5-6). This asserted requisite evidence, the motivation to combine is improper.

In addition to aforementioned rejection of claims 1 and 13 of this Office Action, Rhodes teaches that the signal detection capability enhances when voltage to current ratio is maintained in the coupler with the transmission line (which uses impedances and are coupled with coupler) since voltage to current ratio is equivalent to resistor (well known ohm's law  $V = IR$ ) and maintaining the ratio in order to protect the signal reflection at the receiver side suggests that if the value of the voltage increases while keeping the current value same, would increase the ratio and enhance the detection capability of the receiver as taught by Rhodes (see col.4, lines 3-13). Therefore, there is a motivation to implement the teachings of the Rhodes into Gardner in order to protect the signal

reflection at the receiving side and enhance it's capability by increasing the voltage and hence is equivalent to applicant's limitations in the claim.

11. In response to applicant's argument regarding claims 9, 10, 19-21, and 25 that:

Applicant first traverses the rejection because claims 9 and 10 depend from claim 1 and claim 25 depends from claim 22. The Patent Office required Gardner and Rhodes to reject claims 1 and 2. The Patent Office admits that Gardner alone does not show the active impedances of claims 1 and 22; this, the Patent Office effectively admits that the combination of Gardner and Beurrier does not show a claim element. Since the combination does not show a claim element, the combination does not establish obviousness.

As mentioned above in the rejection of claims 1 and 22 the Gardner and Rhodes teach the claims limitations and therefore when combines with Beurrier establish obviousness for claims 9, 10, and 25 (Office Action of May 16,2005, page 6 & 7, lines 11-22 & lines 1-14 respectively).

12. In response to Applicant's argument that:

Claim 19 recites a transformer with first, second, and third coils with the third coil positioned in a receive path of the modem. The Patent Office continues to extract and modify portions of Gardner without explaining the justification for the modifications.

See rejection of claim 1 as mentioned above in this Office Action.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-Rakshani et al. (US 2004/0064275) disclose system and method for detecting a device requiring power.

-Bisson et al. (US 6,323,686) disclose crest factor compensated driver.

-Moore (5,210,519) discloses digital data transmission.

Art Unit: 2631

-Abraham (6,104,707) discloses transformer coupler for communication over various lines.

-Vitenberg (US 6,459,739) discloses method and apparatus for RF common-mode noise rejection in a DSL receiver.

-Prat et al. (US 6,804,349) disclose hybrid transceiver circuit.

-Hernandez-Marti (US 2003/0085732) discloses method and device for active impedance matching.

#### ***Contact Information***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naheed Ejaz whose telephone number is 571-272-5947. The examiner can normally be reached on Monday - Friday 8:00 - 4:30.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2631

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Naheed Ejaz  
Examiner  
Art Unit 2631

N.Ejaz  
10/27/2005

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PRIMA EXAMINER